HP StorageWorks

XP10000 Disk Array Owner's Guide

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About this guide

This guide provides information about owning and operating the HP StorageWorks XP10000 Disk Array.

Unless otherwise noted, the term *disk array* in this guide refers to the HP XP10000 Disk Array.

Intended audience

This guide is intended for system administrators with knowledge of:

- host hardware
- host operating system
- RAID technology

Related documentation

The following documents provide related information:

- *HP StorageWorks XP10000 Disk Array Site Preparation Guide*
- *HP StorageWorks XP Remote Web Console user guide for XP12000/XP10000 Disk Arrays and SVS 200*
- *HP StorageWorks XP External Storage for XP12000/XP10000 Disk Arrays and SVS 200*
- HP StorageWorks XP disk array configuration guides for host operating systems

You can find these documents from the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

In the Storage section, click **Disk Storage Systems** and then select the XP10000 disk array product under XP Disk Arrays.

Document conventions and symbols

Table 1 Document conventions

Convention	Element
Blue text: Document conventions and symbols	Cross-reference links and e-mail addresses
Blue, underlined text: http://www.hp.com	Website addresses

Convention	Element
Bold text	• Keys that are pressed • Text typed into a GUI element, such as a box • GUI elements that are clicked or selected, such as menu and list items, buttons, tabs, and check boxes
Italic text	Text emphasis
`Monospace` text	• File and directory names • System output • Code • Commands, their arguments, and argument values
`Monospace, italic` text	• Code variables • Command variables
`Monospace, bold` text	Emphasized monospace text

⚠ WARNING!

Indicates that failure to follow directions could result in bodily harm or death.

△ CAUTION:

Indicates that failure to follow directions could result in damage to equipment or data.

IMPORTANT:

Provides clarifying information or specific instructions.

NOTE:

Provides additional information.

TIP:

Provides helpful hints and shortcuts.

Conventions for storage capacity values

Use the following values to calculate physical storage capacity (hard disk drives) for HP XP storage systems:

- 1 KB (kilobyte) = 1,000 bytes
- 1 MB (megabyte) = $1{,}000^2$ bytes
- 1 GB (gigabyte) = $1{,}000^3$ bytes
- 1 TB (terabyte) = $1{,}000^4$ bytes

Use the following values to calculate logical storage capacity (logical devices) for HP XP storage systems:

- 1 KB (kilobyte) = 1,024 bytes
- 1 MB (megabyte) = $1{,}024^2$ bytes
- 1 GB (gigabyte) = $1{,}024^3$ bytes
- 1 TB (terabyte) = $1{,}024^4$ bytes
- 1 block = 512 bytes

Rack stability

Rack stability protects personnel and equipment.

⚠ WARNING!

To reduce the risk of personal injury or damage to equipment:

- Extend leveling jacks to the floor.
- Ensure that the full weight of the rack rests on the leveling jacks.
- Install stabilizing feet on the rack.
- In multiple-rack installations, fasten racks together securely.
- Extend only one rack component at a time. Racks can become unstable if more than one component is extended.

HP technical support

Telephone numbers for worldwide technical support are listed on the HP support website:

http://www.hp.com/support/

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Error messages
- Operating system type and revision level

- Detailed questions

For continuous quality improvement, calls may be recorded or monitored.

Customer self repair

HP customer self repair (CSR) programs allow you to repair your StorageWorks product. If a CSR part needs replacing, HP ships the part directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your HP-authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider. For North America, see the CSR website:

http://www.hp.com/go/selfrepair

This product has no customer replaceable components.

Product warranties

For information about HP StorageWorks product warranties, see the warranty information website:

http://www.hp.com/go/storagewarranty

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/e-updates

After registering, you will receive e-mail notification of product enhancements, new driver versions, firmware updates, and other product resources.

HP websites

For additional information, see the following HP websites:

- http://www.hp.com
- http://www.hp.com/go/storage
- http://www.hp.com/service_locator
- http://www.hp.com/support/manuals
- http://www.hp.com/support/downloads

Documentation feedback

HP welcomes your feedback.

To make comments and suggestions about product documentation, please send a message to storagedocsFeedback@hp.com. All submissions become the property of HP.

1 Overview of the HP XP10000 Disk Array

This disk array is part of the HP StorageWorks XP Disk Array series of high-performance RAID-capable disk array systems used to store large quantities of data in an efficient and secure manner. XP disk arrays support multiple operating systems, platforms, and RAID groups. Advantages include:

- Continuous data availability
- Non-disruptive service and upgrades
- Connectivity
- Scalability
- Data integrity and high availability

Continuous data availability

The HP StorageWorks XP Disk Array family includes the first RAID disk arrays to provide truly continuous data availability. XP disk arrays are designed for nonstop operation and continuous access to all user data.

Continuous data availability features include:

- No single point of component failure
- Component and function redundancy for disk array microprocessors, control storage, cache, control and data buses, power supplies, and cooling fans

Although the failure of a key component can cause a temporary reduction in performance, the disk array can sustain multiple component failures and still continue to provide full access to stored data.

Non-disruptive service and upgrades

Without disrupting normal disk array operations (if alternate pathing is used), an HP support representative can:

- Remove, service, repair, or replace hardware subassemblies
- Use the built-in service processor (SVP) to upgrade microcode

Alternate paths can be established using host failover software, alternate Fibre Channel paths, nonstop SCSI, or combination solutions.

△ CAUTION:

The disk array has no user-serviceable components. The SVP does not include a keyboard or monitor and is not a customer-accessible component. Only an HP support representative should open the disk array cabinets.

HP StorageWorks XP Continuous Track monitoring software detects internal hardware component problems and automatically reports them to the HP Storage Technology Center (STC) before they are noticed by operators and users. An HP support representative can verify the problem and perform

the appropriate maintenance activity, without interruption to applications or hosts. For more information, see "HP StorageWorks Continuous Track XP" on page 17.

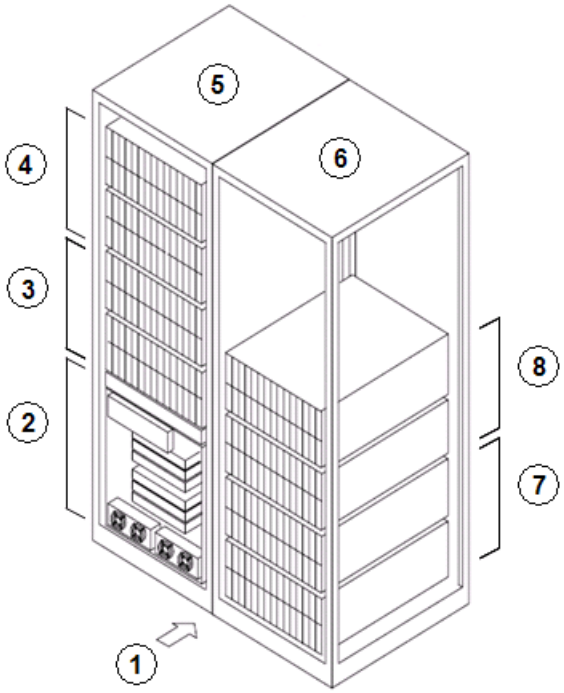
Connectivity

The system can be configured to provide the following types of host connections:

- **Fibre Channel:** Open Systems; FC-AL or Fabric; 1, 2, or 4 Gbps, single or multimode; LC-Duplex
- **ESCON:** mainframe, serial
- **FICON:** mainframe, LC-Duplex, single or multimode, 1, 2, or 4 Gbps
- **iSCSI:** 8 ports per adapter, 1 Gbps
- **NAS:** 8 ports per adapter, 1 Gbps

Scalability

The disk array is scalable to accommodate your current and future storage capacity needs. Figure 1 and the following text describe the disk array equipment racks.



1. Front of the open HP XP10000 disk array
2. Controller, power supplies, control panel, SVP, disk adapters
3. R0 disk chassis, containing up to 60 disk drives
4. R1 disk chassis, containing up to 60 disk drives
5. Primary rack
6. Second rack
7. R2 disk chassis, containing up to 60 disk drives
8. R3 disk chassis, containing up to 60 disk drives

Figure 1 HP XP10000 Disk Array configuration

Basic configuration

The basic configuration consists of the following:

- one 19-inch rack (#5 in Figure 1)
- One disk controller including a control panel and SVP blade PC
- A mix board containing disk adapters and host ports
- Power supplies, power distribution units (PDUs), backup batteries, power cords, and cabling
- One 60-disk chassis (R0, #3 in Figure 1)

The HP XP10000 disk array is also available without a disk chassis.

Adding storage

You can expand the basic configuration by adding disk chassis and disk drives in the following order:

1. Add a 60-disk chassis (R1, #4 in Figure 1) to the top space of the primary rack. This provides a total of up to 120 drives.

2. Add a second rack with one 60-disk chassis (R2, #7 in Figure 1), providing a total of up to 180 drives.
3. Add a second 60-disk chassis (R3, #8 in Figure 1) to the second rack for a total of up to 240 drives.

An HP support representative is required to add disk chassis and disk drives. Disk chassis and disk drives can be added online without interruption to applications or hosts.

Data integrity and high availability

To provide the highest levels of data integrity and availability, the HP StorageWorks XP Disk Array family uses RAID technologies and redundant hardware throughout the disk arrays, including:

- RAID1, RAID5, and RAID6 (mixing RAID levels is allowed)
- Mirrored write cache
- Dual channel adapters (CHAs)
- Dual and concurrently active data and control paths through the array
- Split power domains on internal data paths
- Hot-pluggable boards
- Hot-pluggable fans, power supplies, and controllers
- Online upgradable firmware

The following features and products help ensure the disk array meets your requirements for high availability:

- Capability to report errors by phone or Internet to the HP Storage Technology Center (STC) using HP StorageWorks XP Continuous Track
- Advanced remote diagnostics
- Full solution (host-SAN-storage) support
- Full software and solution integration enabled by HP software products. For more information, see "HP XP10000 Software" on page 17.

HP XP10000 product contents

The HP XP10000 disk array product includes hardware, software, services, and support. Some additional components are required and others are optional, as described in this section. For the most current product information, visit the HP website:

http://h18006.www1.hp.com/storage/enterprisestorage.html

Included components

The HP XP10000 base product includes the following hardware, software, services, and support:

- One primary rack containing a controller, a disk chassis* for holding up to 60 drives, basic redundant power supplies, batteries, and cables
- Blade PC Service Processor (SVP)
- Modem
- HP microcode
- XP Remote Web Console web-based array management software
- HP XP Continuous Track software

- HP RAID Manager Library software
- Site preparation services
- Installation and configuration services
- Proactive monitoring and support
- Reactive hardware support
- Software support
- Documentation CD including this owner's guide, configuration guides for host operating systems, and software guides

*The product is also available without a disk chassis.

Additional required components

- Cache memory
- Shared memory
- MIX pair (combined channel and disk adapters)
- Hard disk drives

Optional components

HP offers an extensive list of optional hardware, software, and services tailored for HP XP disk arrays, including the following:

- Additional CHIP pair (channel interface processor)
- Additional disk chassis
- Additional cache memory
- Additional shared memory
- HP StorageWorks Command View XP Advanced Edition Software

For more information about software options, see "HP XP10000 Software" on page 17 or contact your HP support representative.

HP XP10000 supported features

This section summarizes basic features of the disk array.

HP XP10000 specifications

See Table 2 for the power, disk drives, memory, RAID levels, and number of LUNs supported by the disk array.

Table 2 HP XP10000 Disk Array specifications

Feature	Specification
Power	Single-phase, 200VAC, 50 or 60 Hz
Equipment racks	One standard primary rack One optional second rack
Disk chassis (60 drives each)	One standard primary rack disk chassis One optional primary rack disk chassis Two optional second rack disk chassis

Feature	Specification
Maximum hard disk drives	120 in one rack, 240 in two racks
Maximum spare disk drives	16
Maximum parity groups/array	59
Maximum disk drive capacity	69.2 TB
Maximum cache	64 GB
Available hard disk drive	73 GB 15,000 RPM FC 146 GB 10,000 RPM or 15,000 RPM FC 300 GB 10,000 RPM or 15,000 RPM FC 400 GB 10,000 RPM or 15,000 RPM FC
Maximum shared memory	6 GB
MIX pairs	1 pair
CHIP pairs	1 pair, available in FC, iSCSI, NAS, FICON, ESCON
Maximum host ports	48 FC
RAID level[1]	RAID 1 (2D+2D or 4D+4D) RAID 5 (3D+1P or 7D+1P) RAID 6 (6D+2P)
Maximum LDEVs	16,384 for OPEN systems; 65,536 for mainframes (OPEN system LDEVS must be in first 16K; mainframe LDEVS may occupy any part of the available range.)
Maximum LUNs	49,152
Maximum LUNs per port	1024

[1]Mixed RAID levels are supported in a disk unit.

Specifications are subject to change without notice. Contact HP for the firmware required to achieve the maximum number of LDEVs.

Supported operating systems

The disk array supports the following operating systems:

- HP-UX
- Linux
- Windows
- HP OpenVMS
- HP Tru64
- Sun Solaris
- IBM AIX
- Novell NetWare
- SGI IRIX64

- Nonstop
- VMware
- z/OS
- Mainframe

For the latest information on supported operating systems and versions, contact your HP support representative or visit the HP website:

http://www.hp.com/

Supported external storage

The disk array connects to the following external storage systems and can provide access to and management of external volumes:

- HP StorageWorks XP48, XP128, XP256, XP512, XP1024, XP10000, and XP12000 disk arrays
- HP StorageWorks Modular Smart Array MSA1000 and MSA1500
- HP StorageWorks EVA3000, EVA4000, EVA5000, EVA6000, and EVA8000 disk arrays
- Specific disk array models of other manufacturers. Consult an HP representative for details.

For more information about HP external storage, see the *HP StorageWorks XP External Storage for XP12000/XP10000 Disk Arrays and SVS 200*.

Web-based array management

The disk array comes with HP StorageWorks XP Remote Web Console, a browser-based interface that runs on the SVP and enables you to manage individual disk arrays. To manage multiple arrays simultaneously, the optional HP StorageWorks Command View XP Advanced Edition Software runs on a single Windows-based server and can be accessed using remote web clients.

HP StorageWorks XP Continuous Track

HP XP Continuous Track (C-Track) is a remote support solution that detects and reports problems even before they are noticed by operators and users. C-Track transmits heartbeats, system information messages (SIMs), and configuration information to HP Storage Technology Centers (STCs) for remote data collection and monitoring. C-Track also enables the STC to remotely diagnose issues and perform maintenance, if you permit remote access.

The C-Track solution offers Internet connectivity and modem connectivity. If you choose the Internet-based remote support solution, additional infrastructure and site preparation are required. This additional preparation may include server and router requirements, which you and HP may be responsible for implementing. For more information about the C-Track Internet-based solution, contact an HP representative.

HP XP10000 Software

HP offers a full suite of software for the HP StorageWorks XP disk arrays. Sophisticated software packages enable you to:

- Manage the disk array configuration
- Monitor array performance
- Optimize your disk array and IT resources
- Improve overall storage availability

- Simplify disaster recovery
- Improve data security

The following topics summarize the types of available software. To learn about specific XP software products, visit the HP website and navigate to XP storage software:

http://www.hp.com

Storage management software

HP includes versatile Java-based management software with the XP disk array and offers a range of additional management tools. Among the additional management tools are volume and security management packages, cache and memory management software, external storage management tools, data management packages, and SAN management software.

Storage management software products include:

- HP StorageWorks XP Remote Web Console
- HP StorageWorks XP LUN Configuration and Security Manager
- HP StorageWorks LUN Security XP Extension
- HP StorageWorks XP Cache LUN
- HP StorageWorks XP Data Shredder
- HP StorageWorks XP Data Integrity Check
- HP StorageWorks Command View XP Advanced Edition Software
- HP StorageWorks XP Provisioning Manager Software
- HP StorageWorks XP External Storage Software
- HP StorageWorks XP Disk/Cache Partition Software
- HP Storage Essentials

Performance management software

XP performance management software allows you to monitor and set thresholds for disk usage, define policies for allocating storage to hosts, and automatically migrate impacted data volumes to lower usage LUNs.

Performance management software products for XP disk arrays include:

- HP StorageWorks XP Auto LUN Software
- HP StorageWorks XP Performance Control Software
- HP StorageWorks XP Performance Advisor Software
- HP StorageWorks XP Tiered Storage Manager Software

Data protection and recovery software

HP offers both array-based and host-based replication software for XP arrays. Make point-in-time copies or snapshots or mirror your data at a remote site for disaster recovery, testing, application development, reporting, and other uses with HP storage replication solutions.

XP data protection and recovery software products include:

- HP StorageWorks XP Business Copy Software
- HP StorageWorks XP Snapshot Software
- HP StorageWorks XP Continuous Access Software (Synchronous and Asynchronous)

- HP StorageWorks XP Continuous Access Journal Software
- HP StorageWorks XP RAID Manager
- HP StorageWorks XP Replication Monitor Software
- HP StorageWorks XP Cluster Extension Software

Mainframe software

HP offers a wide range of mainframe software, including disaster recovery applications, point-in-time copy solutions, backup applications, and migration solutions. HP mainframe applications merge open systems and mainframe storage with the HP XP family of arrays for maximum flexibility, scalability, and ease of management.

XP mainframe software products include:

- HP StorageWorks XP Cache Residency Manager
- HP StorageWorks XP for Business Continuity Manager Software
- HP StorageWorks XP for Compatible Parallel Access Software
- HP StorageWorks XP for FlashCopy Mirroring Software
- HP StorageWorks XP for Compatible Extended Remote Copy (XRC) Software
- HP StorageWorks Dataset Replication Manager (Logical Volume Divider)
- HP StorageWorks XP Data Exchange
- Hitachi Cache Manager
- Hitachi ShadowImage™ for z/OS
- Hitachi TrueCopy up™ for z/OS
- Hitachi Universal Replicator™ for z/OS

2 HP XP10000 hardware components

There are no single points of failure in HP XP10000 disk arrays. Redundant logic assemblies, controllers, disk drives, and power supplies can be removed or replaced without interrupting access to data. This section describes individual physical components of the disk array. See Figure 1 on page 13 for an overview of the disk array hardware.

△ CAUTION:

Only your HP support representative can remove or replace hardware.

Disk controller

The disk controller is part of the basic disk array configuration housed in the primary rack and controls disk array operation. It contains the control panel, connection hardware, power supplies, SVP, and control boards for the disk array.

Service processor (SVP)

The Service Processor inside the controller performs these functions:

- Collects performance data on the system for diagnostic testing and analysis
- Provides your HP support representative with access to the system
- Hosts system management software

HP support representatives use the SVP to configure, maintain, and upgrade the system software and hardware. The SVP is not a customer-accessible component.

To protect your security, the SVP does not have access to any user data stored on array disks.

If you have extreme availability requirements, an optional second SVP is available.

Control panel

Once the disk array is powered on and running normally, no user operations are required at the control panel, except when instructed by your HP support representative.

Figure 2 and Table 3 describe the control panel.

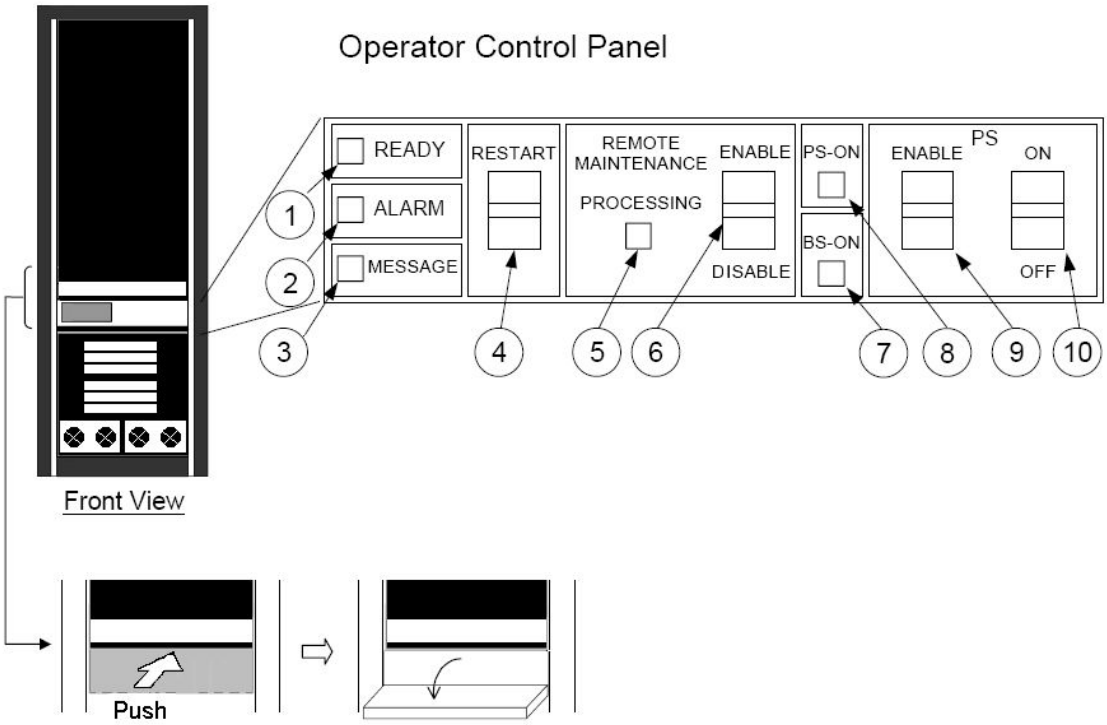


Figure 2 HP XP10000 control panel components

Table 3 HP XP10000 control panel components

Item	Label	Indicator	Description
1	READY	LED (Green)	During normal operation, this LED should be on. **ON:** Input/output on the channel interface is enabled. **OFF:** The system is not accepting data.
2	ALARM	LED (Red)	During normal operation, this LED should be off. **ON:** One or more of the following: The DC is under voltage. The DC is over current. The temperature is abnormally high. An unrecoverable failure has occurred. If the disk array is set up with remote support; your HP support representative is notified automatically. If the disk array is not set up with remote support, place a service call to HP to have the message evaluated to determine if any action is required. **BLINKING:** The DC is under voltage.

Item	Label	Indicator	Description
3	MESSAGE	LED (Amber)	During normal operation, this LED should be off. **ON:** A service information message (SIM) has been issued from either storage cluster. If the disk array is set up for remote support, your HP support representative is notified automatically. If the disk array is not set up with remote support, place a service call to HP to have the message evaluated to determine if any action is required. **BLINKING:** An SVP failure has occurred. The disk array will continue to operate normally. Place a service call to HP to ensure notification. SVP failures might not be reported automatically to STC.
4	RESTART	Switch	If a blocked path occurs between a host and a disk drive, this switch is used to unfence the fenced drive path and to release Write Inhibit. During normal operation, this switch should be in the upper position. Restarting the array performs a soft reset to try to recover. If the system restart does not unblock the path, an HP support representative will be notified. CAUTION: Do not change the switch position unless directed to do so by HP service personnel.
5	REMOTE MAINTENANCE PROCESSING	LED (Amber)	During normal operation, this LED may be on if remote maintenance is occurring. Remote maintenance can occur and this LED can light only when the REMOTE MAINTENANCE ENABLE/DISABLE switch is in the ENABLE position. **ON:** Remote maintenance is in progress. An HP support representative is probably working on the system. The system remains online and accepting data.
6	REMOTE MAINTENANCE ENABLE/DISABLE	Switch	Used to permit remote service maintenance. During normal operation, this switch should be in the ENABLE position. **DISABLE:** No one can provide remote maintenance. **ENABLE:** An HP support representative can provide remote maintenance. CAUTION: Do not change the switch position unless directed to do so by HP service personnel.

Item	Label	Indicator	Description
7	BS-ON	LED (Amber)	During normal operation, this LED should be on. **ON:** The disk array is plugged in and receiving power from the primary AC outlet. The SVP is receiving power from the outlet. **OFF:** The disk array is not receiving power from the primary AC outlet. Check the electrical outlets in your building.
8	PS-ON	LED (Green)	During normal operation, this LED should be on. **ON:** The PS ON/OFF switch is on. If the READY light is also on, the disk array is ready to receive data. **OFF:** The PS ON/OFF switch is off and the disk array is not ready to receive data.
9	PS ENABLE	Switch	Used to enable the PS ON/OFF switch. During normal operation, this switch should be in the "Disable" position (opposite the ENABLE position). **ENABLE:** The PS ON/OFF switch can be used. **DISABLE:** The PS ON/OFF switch cannot be used. CAUTION: Do not change the switch position unless directed to do so by HP service personnel.
10	PS ON/OFF	Switch	Used to power on/off the disk array. During normal operation, this switch should be in the ON position. The switch functions only if the PS ENABLE switch is in the ENABLE position. CAUTION: Do not change the switch position unless directed to do so by HP service personnel.

Disk chassis

The disk array chassis house the physical disk drives. Each chassis can contain up to 60 hard disk drives. The disk array can include up to four disk chassis, two in the primary rack and two more in the optional second rack.

Disk drives

The primary rack comes with one chassis (R0) which must contain at least four hard disk drives and can contain up to 60 drives. (A basic version of the HP XP10000 disk array without a disk chassis is also available.) A second chassis (R1) adds 60 more drives to the primary rack for a total of 120 drives. With a second rack, you can add one more disk chassis for up to 180 drives, or you can add two more chassis for a maximum of four fully populated disk chassis containing up to 240 physical disk drives. A variety of disk capacities are available. Ask your HP support representative about currently available disk drives. The disk array automatically detects and corrects disk errors, and an HP support representative can replace any of the disk drives without disrupting user activity.

The disk array must contain at least one spare disk drive and can contain up to 16. Any of the spare disk drives can back up any other disk drive of equal rotational speed and equal or lesser capacity, in any disk chassis, even if the failed disk and the spare disk are in different array domains.

The XP10000 disk array supports 73 GB, 146 GB, 300 GB and 400 GB Fibre Channel disk drives. Fibre Channel drives are intended as a high capacity, high performance storage option within the array for high priority applications such as OLTP, Oracle, SAP, and Exchange.

Backup batteries

Internal batteries provide backup power for the cache memory, shared memory, MIXs, CHIPs, and disk drives. The backup batteries enable the disk array to continue normal operations for up to 20 milliseconds after the loss of AC power.

When AC power is off longer than 20 milliseconds, the disk array executes its backup process. This process copies the contents of cache and shared memory to disk and then supports cache and shared memory for up to 36 hours. When AC power is restored after battery backup is exhausted, time is required for staging data from disk back to shared and cache memory. Figure 3 shows the sequence of events between a power failure and the battery-powered backup of cache and shared memory.

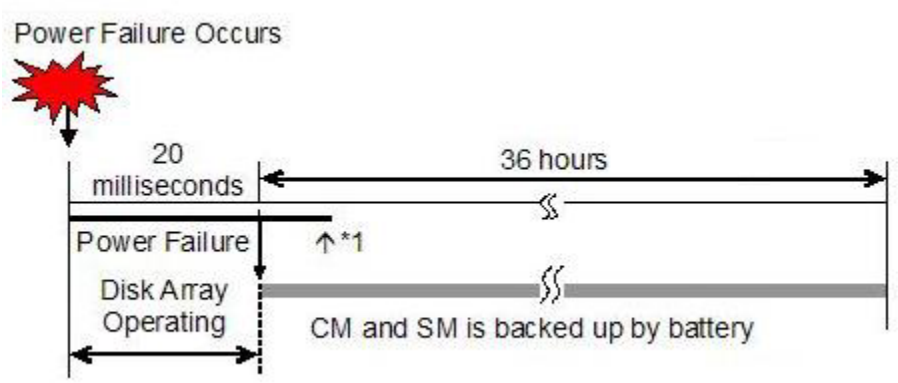


Figure 3 Backup power sequence

When power is restored, if the Auto-Power-On jumper is in the ENABLE position, the disk array powers on automatically. If the jumper is in the DISABLE position, you must turn the power switch on to power up the disk array. HP representatives will assist you in determining which Auto-Power-On mode is best for your disk array configuration and will configure the selected mode during disk array installation.

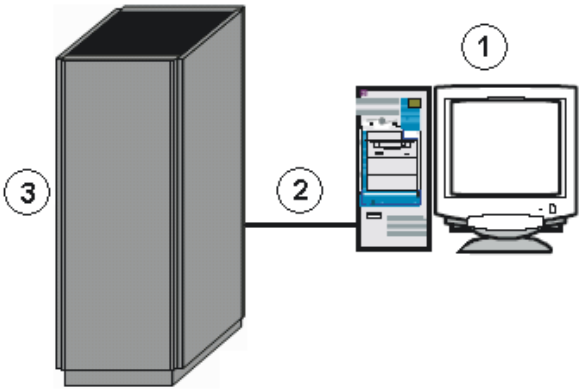
Optional management server

HP Remote Web Console allows browser-based management of a single disk array. The optional HP StorageWorks Command View XP Advanced Edition software may be installed on an optional Device Manager server to enable additional management capabilities, including the ability to manage multiple arrays. Other XP software may also be installed on this host; see "HP XP10000 Software" on page 17 for information about optional software products.

To protect your security, HP XP Remote Web Console and HP Command View XP Advanced Edition Software have no access to user data stored on the disk array.

You may use an existing host (such as a storage administrator's PC) as the Device Manager server provided that it meets system requirements for the required and optional software you plan to deploy.

Figure 4 shows a Command View XP Advanced Edition server connected to an XP disk array. The management server (1) connects to the disk array (3) using a private Ethernet LAN (2).



1. Command View XP Advanced Edition server
2. Ethernet LAN connection
3. XP disk array

Figure 4 Optional HP StorageWorks XP Command View Advanced Edition software configuration

3 HP XP10000 operations

During normal operations, the disk array does not require intervention and you should not attempt to open the disk array cabinets.

The disk array reports any service information messages (SIMs) to the SVP and the Device Manager server. If the array is set up for remote support, the SVP automatically reports SIMs to the HP Storage Technology Center (STC). For more information on SIMs, see "Service information messages" on page 33.

This chapter describes the procedure for the rare event that you need to power down or restart the disk array. General operating specifications appear at the end of this chapter.

General safety guidelines

Carefully read these safety guidelines and follow them when working with the disk array.

- Fully understand and follow all hazard warnings in this guide and on warning labels on the disk array. These hazard warnings help you to prevent or reduce the risk of death, personal injury, or product damage. Hazard warnings include alert headings consisting of an alert symbol and the word *Caution* or *Warning*:

△ CAUTION:

This indicates a hazardous situation which, if not avoided, will or can result in serious product damage or loss of data.

⚠ WARNING!

This indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

- Replace any warning label that becomes dirty or starts peeling off.
- Keep in mind that the hazard warnings in this guide and on the disk array cannot cover every possible hazard because it is impossible to predict and evaluate all potentially hazardous circumstances. Be alert and use common sense. If you have any questions, contact your HP support representative.
- Follow the safety guidelines and procedures in all documentation for this and related products.

△ CAUTION:

Disk array maintenance must be done only by trained and qualified HP support representatives. Only an HP support representative can power off the disk array, except in an emergency.

△ CAUTION:

Do not perform any procedures not described in this guide. If you have any questions or concerns, contact your HP support representative.

⚠ WARNING!

Do not touch areas marked HAZARDOUS, even with the power off. These areas contain high-voltage power.

△ CAUTION:

If you detect any abnormal noise, smell, or smoke coming from the disk array, immediately power off the disk array by following the emergency power off procedure later in this chapter. For routine power off in non-emergency situations, contact your HP support representative.

△ CAUTION:

Do not power off the system unless it is an emergency situation and you follow the procedure for Emergency power off.

△ CAUTION:

Keep the front and rear doors closed at all times.

△ CAUTION:

Keep the tops and sides of the cabinets clear to allow air to flow properly.

△ CAUTION:

Use the supplied power cord. The power cord may not be used with other products.

Powering down the disk array

Two situations may arise when you need to power down the system:

- Emergency power off
- Planned power off

For instructions in each of these situations, see the following procedures.

Emergency power off

The system does not have an emergency power off switch. In an emergency when it is crucial to power off the system immediately for safety reasons, remove power at the AC branch circuit breakers in your facility that supply power to the system. Take care when placing these breakers that they are clearly marked and easily accessible.

△ CAUTION:

Performing an emergency power off immediately shuts down the system, neglecting the normal power off sequence. Jobs in process are aborted and their integrity after recovery is not guaranteed. Use this power off method **only** in an emergency. Afterwards, only a qualified HP support representative is allowed to restore power to the system. Call your HP support representative immediately.

Emergency situations in which you should consider performing the emergency power off procedure are:

- A physical location catastrophe such as a flood, hurricane, tornado, or earthquake
- Any circumstance that presents the threat of injury or death to a person
- You detect any smoke, abnormal loud noise, or smell coming from the disk array.

Planned power off

Occasionally, you may need to plan a site power outage, such as during alterations to the data center, inspections, or work by the electric company. If a scheduled power outage will affect the system, contact your HP support representative to schedule a planned power off.

△ CAUTION:

Only a trained HP support representative can shut down and power off the system.
Do not attempt to power down the disk array other than during an emergency.

Recovering from an unplanned power outage

Unplanned power outages occur when the primary building power is lost due to electrical blackouts, thunderstorm activity, or similar occurrences, and input AC power is not received by the system. The system will maintain its state and recover when power is restored.

The system cache is powered by backup batteries that will maintain the system state for up to 36 hours, depending on the selected battery operation mode.

For restart procedures after power is restored to the system, see the following text about manual and automatic restart of the system.

Manual restart after power is restored

△ CAUTION:

After power is restored to your site and before restoring power to the system, HP recommends that you have an electrician verify the power to ensure that all phases are restored and input power is stable. Before you power on the system, power on any external disk array(s) first and make sure they are operating properly.

For assistance recovering from a power outage, contact your HP support representative.

To restart the disk array manually:

1. On the control panel, move the PS ENABLE switch to the ENABLE position.
2. Move the PS ON/OFF switch to the ON position.

   The following LED power sequence occurs:

   BS-ON turns amber.

   PS-ON turns green.

   MESSAGE LED may turn amber if the system is not configured for remote support, signifying a SIM was generated because the system lost power unexpectedly.

   READY LED turns green, signifying the system is ready.

   △ CAUTION:

   Power on can take several minutes and is not complete until the READY LED turns green.

3. Move the PS ENABLE switch to “DISABLE” (opposite the ENABLE position).

Automatic restart when power is restored

△ CAUTION:

HP recommends the use of automatic power on restart **only** if the power to the system is subject to power conditioning equipment, such as a UPS, to ensure that the power restored to the system is stable. If your site does not have a UPS, HP recommends configuring the disk array for manual restart, meaning the Auto-Power-On jumper, which is set during installation by an HP support representative, is in the DISABLE position. After a power outage, follow the preceding manual restart procedure only after power has been restored and verified to be stable. Before you power on the system, power on any external disk arrays and make sure they are operating properly.

Automatic restart is enabled by your HP representative during installation. With automatic restart enabled, the system automatically restarts and returns to service when power is restored after a power outage.

During the automatic restart, the following LED power sequence occurs:

BS-ON turns amber.

PS-ON turns green.

MESSAGE LED may turn amber if the system is not configured for remote support, signifying a SIM was generated because the system lost power unexpectedly.

READY LED turns green, signifying the system is ready.

△ CAUTION:

Powering on the disk array can take several minutes. Power on is complete only when the READY LED turns green.

Operating specifications

This section provides some general specifications. For complete specifications, see the system site preparation guide, available on the HP XP Disk Array website:

http://h18006.www1.hp.com/storage/xparrays.html

Temperature

Table 4 Temperature specifications

Temperature range type	Range
Recommended operating temperature range	21 to 24 degrees C70 to 75 degrees F
Operating temperature	16 to 32 degrees C61 to 89 degrees F
Non-operating temperature range	–10 to +43 degrees C14 to 109 degrees F
Shipping and storage temperature (product packed in factory packing)	–25 to +60 degrees C–13 to +140 degrees F
Temperature shock immunity (maximum rate of temperature change)	10 degrees C per hour18 degrees F per hour

Humidity

Protect the disk array from excessive humidity. You should not observe condensation in or around the product under any conditions. There is no procedure for recovery from moisture condensation.

Table 5 Humidity specifications

Humidity range type	Non-condensing relative humidity (RH)
Operating humidity range at 22 degrees C (71 degrees F)	20% to 80%
Non-operating humidity range	8% to 90%
Shipping and storage humidity range (product packed in factory packing)	5% to 95%
Operating maximum wet bulb temperature	26 degrees C (79 F)

Humidity range type	Non-condensing relative humidity (RH)
Non-operating maximum wet bulb temperature	27 degrees C (81 F)
Shipping and storage maximum wet bulb temperature	29 degrees C (84 F)

Mechanical vibration

Continuous vibration can cause a slow degradation of mechanical parts and, when severe, can cause data errors in disk drives. Mechanical connections such as printed circuit assembly (PCA) conductors, cable connectors, and processor backplane wiring can also be affected by vibrations. Vibration specifications apply to all three axes.

Table 6 Mechanical vibration specifications

Condition	Specification
Operating	0.25 mm, 5–10 Hz0.05 G, 10–300 Hz
Non-operating	2.5 mm, 5–10 Hz0.5 G, 10–70 Hz0.05 mm, 70–99 Hz1.0 G, 99–300 Hz

AC line voltage requirements

This section lists the AC power recommendations. Each rack has four power cords. In case of a failure of the power source for one cord, the power requirements, and therefore the current requirement for the remaining power cord, will double.

For details about electrical specifications, cabling, and connectors, see the *HP StorageWorks XP10000 Disk Array Site Preparation Guide*.

Table 7 AC voltage specifications

Parameter	200 VAC	208 VAC 60 Hz Only	220 VAC	230 VAC	240 VAC
Rated line current per power cord	16A	16A	16A	16A	16A
Number of power cords per rack	4	4	4	4	4
Recommended circuit breakers	20A	20A	20A	20A	20A

HP requires a separate branch circuit for each power cord connection. The circuit breaker for each branch circuit must have a minimum rating of 20 amps. Breakers must be easily visible and accessible so power can be quickly removed in an emergency. Local building electrical codes may dictate specific additional circuit breaker requirements. Consult your electrician or local code for the requirements in your location.

If you have multiple power sources, such as a UPS, connect two of the power cords for each cabinet to each power source for maximum protection from power outages. Consult your local HP service representative about which power cords are to be attached to the two power sources.

4 HP XP10000 Troubleshooting

Service information messages

The system generates service information messages (SIMs) to identify normal operations, service requirements, and failures. SIMs are generated by the SVP and the system microprocessors. Your HP support representative uses the SIMs to monitor and troubleshoot the system. You can view SIMs using the system's management software.

Failure detection and reporting process

If a failure occurs in the system, the failure is detected and reported to the system log, the SIM log, and the HP STC, as shown in the Figure 5 and Table 8.

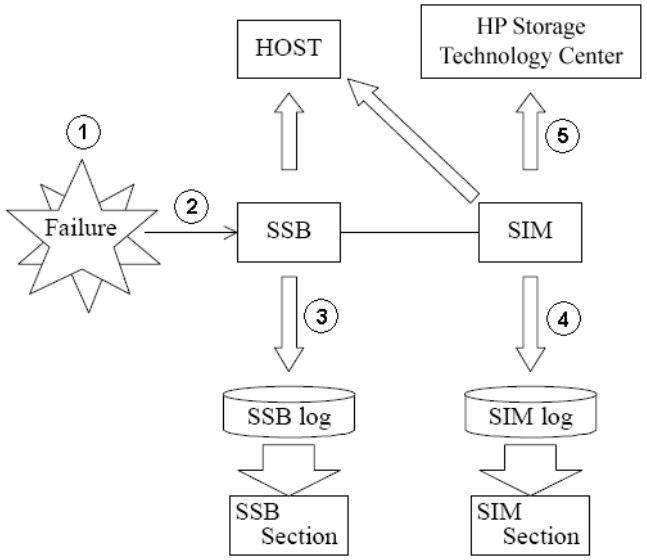


Figure 5 Failure detection and reporting process

Table 8 Failure detection and reporting process

Item	Description
1	A failure is detected in the system.
2	The failure is reported to the system.
3	The system stores the failure information in the system log.
4	The generated SIMs are stored on the system for use by HP support representatives, and logged on the Device Manager server as remote SIMs (R-Sims). If the disk array is not set up with remote support, when a SIM is generated, the amber message LED on the system control panel turns on. Call HP to determine the reason for the message.

Item	Description
5	If the system is set up for remote support, HP XP Continuous Track reports the SIMs to STC through a dedicated dialup connection.SIMs are classified according to severity: service, moderate, serious, or acute. Service and moderate levels do not require immediate attention and are addressed during routine maintenance. These failures are often corrected before the failure becomes apparent. Serious and acute levels are reported immediately to STC to ensure that the problem is addressed as soon as possible.

5 Regulatory statements

FCC EMC statement (USA)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense. The end user of this product should be aware that any changes or modifications made to this equipment without the approval of Hewlett-Packard could result in the product not meeting the Class A limits, in which case the FCC could void the user's authority to operate the equipment.

Hewlett-Packard's device certification tests were conducted with HP computer systems and HP shielded cables, such as those you received with your product. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment. Cables used with this device must be properly shielded to comply with the requirements of the FCC.

IEC statement (worldwide)

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

EMC statement (Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Spécification ATI Classe A (France)

DECLARATION D'INSTALLATION ET DE MISE EN EXPLOITATION d'un matériel de traitement de l'information (ATI), classé A en fonction des niveaux de perturbations radioélectriques émis, définis dans la norme européenne EN 55022 concernant la Compatibilité Electromagnétique.

VCCI EMC statement (Japan)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI EMC statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策的對策

RRL EMC statement (Korea)

사용자 안내문 :A 급 기기

이 기기는 업무용으로 전자파적합등록을 받은 기기이오니, 판매자 또는 사용자는 이 점을 주의 하시기 바라며, 만약 잘못 구입 하셨을 때에는 구입한 곳에서 비업무용으로 교환 하시기 바랍니다.

Harmonics conformance (Japan)

高調波ガイドライン適合品

German noise declaration

XP10000: Schalldruckpegel Lp = 70 dB(A)

Am Arbeitsplatz (operator position)

Normaler Betrieb (normal operation)

Nach ISO 7779:1988 / EN 27779:1991 (Typprüfung)

Laser safety

When equipped with native Fibre Channel adapters, this product contains a laser internal to the Optical Link Module (OLM) contained on the 8-port Fibre Channel Adapter board and 8-port FICON

board, and on the 16-port Fibre Channel Adapter board and 16-port FICON board for connection to a fibre communications network.

In the USA, the OLM is certified as a Class 1 laser product conforming to the PRT requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. The certification is indicated by a label on the plastic OLM housing. Outside the USA, the OLM is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996.

The following figure shows the Class 1 information label that appears on the plastic housing of the OLM.

CLASS 1 LASER PRODUCT

Complies with

21 CFR 1040.10 and 1040.11

Each communications port consists of a transmitter and receiver optical subassembly. The transmitter subassembly contains an internal semiconductor laser diode in the wavelength range of 770 to 850 nanometers. In the event of a break anywhere in the fibre path, the OLM control system prevents laser emissions from exceeding Class 1 levels. Class 1 laser products are not considered hazardous.

⚠ WARNING!

There are no user maintenance operations, service operations, or adjustments to be performed on the Optical Link Module.

Japan DENAN law cordset caution

Please use the supplied power cord. The power cord may not be used with other products.

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

European WEEE statements

Czech

Likvidace zařízení soukromými domácími uživateli v Evropské unii

Tento symbol na produktu nebo balení označuje výrobek, který nesmí být vyhozen spolu s ostatním domácím odpadem. Povinností uživatele je předat takto označený odpad na předem určené sběrné místo pro recyklaci elektrických a elektronických zařízení. Okamžité třídění a recyklace odpadu pomůže uchovat přírodní prostředí a zajistí takový způsob recyklace, který ochrání zdraví a životní prostředí člověka. Další informace o možnostech odevzdání odpadu k recyklaci získáte na příslušném obecním nebo městském úřadě, od firmy zabývající se sběrem a svozem odpadu nebo v obchodě, kde jste produkt zakoupili.

Danish

Bortskaffelse af affald fra husstande i den Europæiske Union

Hvis produktet eller dets emballage er forsynet med dette symbol, angiver det, at produktet ikke må bortskaffes med andet almindeligt husholdningsaffald. I stedet er det dit ansvar at bortskaffe kasseret udstyr ved at aflevere det på den kommunale genbrugsstation, der forestår genvinding af kasseret elektrisk og elektronisk udstyr. Den centrale modtagelse og genvinding af kasseret udstyr i forbindelse med bortskaffelsen bidrager til bevarelse af naturlige ressourcer og sikrer, at udstyret genvindes på en måde, der beskytter både mennesker og miljø. Yderligere oplysninger om, hvor du kan aflevere kasseret udstyr til genvinding, kan du få hos kommunen, den lokale genbrugsstation eller i den butik, hvor du købte produktet.

Dutch

Verwijdering van afgedankte apparatuur door privé-gebruikers in de Europese Unie

Dit symbool op het product of de verpakking geeft aan dat dit product niet mag worden gedeponeerd bij het normale huishoudelijke afval. U bent zelf verantwoordelijk voor het inleveren van uw afgedankte apparatuur bij een inzamelingspunt voor het recyclen van oude elektrische en elektronische apparatuur. Door uw oude apparatuur apart aan te bieden en te recyclen, kunnen natuurlijke bronnen worden behouden en kan het materiaal worden hergebruikt op een manier waarmee de volksgezondheid en het milieu worden beschermd. Neem contact op met uw gemeente, het afvalinzamelingsbedrijf of de winkel waar u het product hebt gekocht voor meer informatie over inzamelingspunten waar u oude apparatuur kunt aanbieden voor recycling.

English

Disposal of Waste Equipment by Users in Private Household in the European Union

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Estonian

Seadmete jäätmete kõrvaldamine eramajapidamistes Euroopa Liidus

See tootel või selle pakendil olev sümbol näitab, et kõnealust toodet ei tohi koos teiste majapidamisjäätmetega kõrvaldada. Teie kohus on oma seadmete jäätmed kõrvaldada, viies need elektri- ja elektroonikaseadmete jäätmete ringlussevõtmiseks selleks ettenähtud kogumispunkti. Seadmete jäätmete eraldi kogumine ja ringlussevõtmine kõrvaldamise ajal aitab kaitsta loodusvarasid ning tagada, et ringlussevõtmine toimub viisil, mis kaitseb inimeste tervist ning keskkonda. Lisateabe saamiseks selle kohta, kuhu oma seadmete jäätmed ringlussevõtmiseks viia, võtke palun ühendust oma kohaliku linnakantselei, majapidamisjäätmete kõrvaldamise teenistuse või kauplusega, kust Te toote ostsite.

Finnish

Laitteiden hävittäminen kotitalouksissa Euroopan unionin alueella

Jos tuotteessa tai sen pakkauksessa on tämä merkki, tuotetta ei saa hävittää kotitalousjätteiden mukana. Tällöin hävitettävä laite on toimitettava sähkölaitteiden ja elektronisten laitteiden kierrätyspisteeseen. Hävitettävien laitteiden erillinen käsittely ja kierrätys auttavat säästämään luonnonvaroja ja varmistamaan, että laite kierrätetään tavalla, joka estää terveyshaitat ja suojelee luontoa. Lisätietoja paikoista, joihin hävitettävät laitteet voi toimittaa kierrätettäväksi, saa ottamalla yhteyttä jätehuoltoon tai liikkeeseen, josta tuote on ostettu.

French

Élimination des appareils mis au rebut par les ménages dans l'Union européenne

Le symbole apposé sur ce produit ou sur son emballage indique que ce produit ne doit pas être jeté avec les déchets ménagers ordinaires. Il est de votre responsabilité de mettre au rebut vos appareils en les déposant dans les centres de collecte publique désignés pour le recyclage des équipements électriques et électroniques. La collecte et le recyclage de vos appareils mis au rebut indépendamment du reste des déchets contribue à la préservation des ressources naturelles et garantit que ces appareils seront recyclés dans le respect de la santé humaine et de l'environnement. Pour obtenir plus d'informations sur les centres de collecte et de recyclage des appareils mis au rebut, veuillez contacter les autorités locales de votre région, l es services de collecte des ordures ménagères ou le magasin dans lequel vous avez acheté ce produit.

German

Entsorgung von Altgeräten aus privaten Haushalten in der EU

Das Symbol auf dem Produkt oder seiner Verpackung weist darauf hin, dass das Produkt nicht über den normalen Hausmüll entsorgt werden darf. Benutzer sind verpflichtet, die Altgeräte an einer Rücknahmestelle für Elektro- und Elektronik-Altgeräte abzugeben. Die getrennte Sammlung und ordnungsgemäße Entsorgung Ihrer Altgeräte trägt zur Erhaltung der natürlichen Ressourcen bei und garantiert eine Wiederverwertung, die die Gesundheit des Menschen und die Umwelt schützt. Informationen dazu, wo Sie Rücknahmestellen für Ihre Altgeräte finden, erhalten Sie bei Ihrer Stadtverwaltung, den örtlichen Müllentsorgungsbetrieben oder im Geschäft, in dem Sie das Gerät erworben haben.

Greek

Απόρριψη άχρηστου εξοπλισμού από χρήστες σε ιδιωτικά νοικοκυριά στην Ευρωπαϊκή Ένωση

Το σύμβολο αυτό στο προϊόν ή τη συσκευασία του υποδεικνύει ότι το συγκεκριμένο προϊόν δεν πρέπει να διατίθεται μαζί με τα άλλα οικιακά σας απορρίμματα. Αντίθετα, είναι δική σας ευθύνη να απορρίψετε τον άχρηστο εξοπλισμό σας παραδίδοντάς τον σε καθορισμένο σημείο συλλογής για την ανακύκλωση άχρηστου ηλεκτρικού και ηλεκτρονικού εξοπλισμού. Η ξεχωριστή συλλογή και ανακύκλωση του άχρηστου εξοπλισμού σας κατά την απόρριψη θα συμβάλει στη διατήρηση των φυσικών πόρων και θα διασφαλίσει ότι η ανακύκλωση γίνεται με τρόπο που προστατεύει την ανθρώπινη υγεία και το περιβάλλον. Για περισσότερες πληροφορίες σχετικά με το πού μπορείτε να παραδώσετε τον άχρηστο εξοπλισμό σας για ανακύκλωση, επικοινωνήστε με το αρμόδιο τοπικό γραφείο, την τοπική υπηρεσία διάθεσης οικιακών απορριμμάτων ή το κατάστημα όπου αγοράσατε το προϊόν.

Hungarian

Készülékek magánháztartásban történő selejtezése az Európai Unió területén

A készüléken, illetve a készülék csomagolásán látható azonos szimbólum annak jelzésére szolgál, hogy a készülék a selejtezés során az egyéb háztartási hulladéktól eltérő módon kezelendő. A vásárló a hulladékká vált készüléket köteles a kijelölt gyűjtőhelyre szállítani az elektromos és elektronikai készülékek újrahasznosítása céljából. A hulladékká vált készülékek selejtezéskori begyűjtése és újrahasznosítása hozzájárul a természeti erőforrások megőrzéséhez, valamint biztosítja a selejtezett termékek környezetre és emberi egészségre nézve biztonságos feldolgozását. A begyűjtés pontos helyéről bővebb tájékoztatást a lakhelye szerint illetékes önkormányzattól, az illetékes szemeteltakarító vállalattól, illetve a terméket elárusító helyen kaphat.

Italian

Smaltimento delle apparecchiature da parte di privati nel territorio dell'Unione Europea

Questo simbolo presente sul prodotto o sulla sua confezione indica che il prodotto non può essere smaltito insieme ai rifiuti domestici. È responsabilità dell'utente smaltire le apparecchiature consegnandole presso un punto di raccolta designato al riciclo e allo smaltimento di apparecchiature elettriche ed elettroniche. La raccolta differenziata e il corretto riciclo delle apparecchiature da smaltire permette di proteggere la salute degli individui e l'ecosistema. Per ulteriori informazioni relative ai punti di raccolta delle apparecchiature, contattare l'ente locale per lo smaltimento dei rifiuti, oppure il negozio presso il quale è stato acquistato il prodotto.

Latvian

Nolietotu iekārtu iznīcināšanas noteikumi lietotājiem Eiropas Savienības privātajās mājsaimniecībās

Šāds simbols uz izstrādājuma vai uz tā iesaiņojuma norāda, ka šo izstrādājumu nedrīkst izmest kopā ar citiem sadzīves atkritumiem. Jūs atbildat par to, lai nolietotās iekārtas tiktu nodotas speciāli iekārtotos punktos, kas paredzēti izmantoto elektrisko un elektronisko iekārtu savākšanai otrreizējai pārstrādei. Atsevišķa nolietoto iekārtu savākšana un otrreizējā pārstrāde palīdzēs saglabāt dabas resursus un garantēs, ka šīs iekārtas tiks otrreizēji pārstrādātas tādā veidā, lai pasargātu vidi un cilvēku veselību. Lai uzzinātu, kur nolietotās iekārtas var izmest otrreizējai pārstrādei, jāvēršas savas dzīves vietas pašvaldībā, sadzīves atkritumu savākšanas dienestā vai veikalā, kurā izstrādājums tika nopirkts.

Lithuanian

Vartotojų iš privačių namų ūkių įrangos atliekų šalinimas Europos Sąjungoje

Šis simbolis ant gaminio arba jo pakuotės rodo, kad šio gaminio šalinti kartu su kitomis namų ūkio atliekomis negalima. Šalintinas įrangos atliekas privalote pristatyti į specialią surinkimo vietą elektros ir elektroninės įrangos atliekoms perdirbti. Atskirai surenkamos ir perdirbamos šalintinos įrangos atliekos padės saugoti gamtinius išteklius ir užtikrinti, kad jos bus perdirbtos tokiu būdu, kuris nekenkia žmonių sveikatai ir aplinkai. Jeigu norite sužinoti daugiau apie tai, kur galima pristatyti perdirbtinas įrangos atliekas, kreipkitės į savo seniūniją, namų ūkio atliekų šalinimo tarnybą arba parduotuvę, kurioje įsigijote gaminį.

Polish

Pozbywanie się zużytego sprzętu przez użytkowników w prywatnych gospodarstwach domowych w Unii Europejskiej

Ten symbol na produkcie lub jego opakowaniu oznacza, że produktu nie wolno wyrzucać do zwykłych pojemników na śmieci. Obowiązkiem użytkownika jest przekazanie zużytego sprzętu do wyznaczonego punktu zbiórki w celu recyklingu odpadów powstałych ze sprzętu elektrycznego i elektronicznego. Osobna zbiórka oraz recykling zużytego sprzętu pomogą w ochronie zasobów naturalnych i zapewnią ponowne wprowadzenie go do obiegu w sposób chroniący zdrowie człowieka i środowisko. Aby uzyskać więcej informacji o tym, gdzie można przekazać zużyty sprzęt do recyklingu, należy się skontaktować z urzędem miasta, zakładem gospodarki odpadami lub sklepem, w którym zakupiono produkt.

Portuguese

Descarte de Lixo Elétrico na Comunidade Européia

Este símbolo encontrado no produto ou na embalagem indica que o produto não deve ser descartado no lixo doméstico comum. É responsabilidade do cliente descartar o material usado (lixo elétrico), encaminhando-o para um ponto de coleta para reciclagem. A coleta e a reciclagem seletivas desse tipo de lixo ajudarão a conservar as reservas naturais; sendo assim, a reciclagem será feita de uma forma segura, protegendo o ambiente e a saúde das pessoas. Para obter mais informações sobre locais que reciclam esse tipo de material, entre em contato com o escritório da HP em sua cidade, com o serviço de coleta de lixo ou com a loja em que o produto foi adquirido.

Slovak

Likvidácia vyradených zariadení v domácnostiach v Európskej únii

Symbol na výrobku alebo jeho balení označuje, že daný výrobok sa nesmie likvidovať s domovým odpadom. Povinnosťou spotrebiteľa je odovzdať vyradené zariadenie v zbernom mieste, ktoré je určené na recykláciu vyradených elektrických a elektronických zariadení. Separovaný zber a recyklácia vyradených zariadení prispieva k ochrane prírodných zdrojov a zabezpečuje, že recyklácia sa vykonáva spôsobom chrániacim ľudské zdravie a životné prostredie. Informácie o zberných miestach na recykláciu vyradených zariadení vám poskytne miestne zastupiteľstvo, spoločnosť zabezpečujúca odvoz domového odpadu alebo obchod, v ktorom ste si výrobok zakúpili.

Slovenian

Odstranjevanje odslužene opreme uporabnikov v zasebnih gospodinjstvih v Evropski uniji

Ta znak na izdelku ali njegovi embalaži pomeni, da izdelka ne smete odvreči med gospodinjske odpadke. Nasprotno, odslužено opremo morate predati na zbirališče, pooblaščeno za recikliranje odslužene električne in elektronske opreme. Ločeno zbiranje in recikliranje odslužene opreme prispeva k ohranjanju naravnih virov in zagotavlja recikliranje te opreme na zdravju in okolju neškodljiv način. Za podrobnejše informacije o tem, kam lahko odpeljete odslužено opremo na recikliranje, se obrnite na pristojni organ, komunalno službo ali trgovino, kjer ste izdelek kupili.

Spanish

Eliminación de residuos de equipos eléctricos y electrónicos por parte de usuarios particulares en la Unión Europea

Este símbolo en el producto o en su envase indica que no debe eliminarse junto con los desperdicios generales de la casa. Es responsabilidad del usuario eliminar los residuos de este tipo depositándolos en un "punto limpio" para el reciclado de residuos eléctricos y electrónicos. La recogida y el reciclado selectivos de los residuos de aparatos eléctricos en el momento de su eliminación contribuirá a conservar los recursos naturales y a garantizar el reciclado de estos residuos de forma que se proteja el medio ambiente y la salud. Para obtener más información sobre los puntos de recogida de residuos eléctricos y electrónicos para reciclado, póngase en contacto con su ayuntamiento, con el servicio de eliminación de residuos domésticos o con el establecimiento en el que adquirió el producto.

Swedish

Bortskaffande av avfallsprodukter från användare i privathushåll inom Europeiska Unionen

Om den här symbolen visas på produkten eller förpackningen betyder det att produkten inte får slängas på samma ställe som hushållssopor. I stället är det ditt ansvar att bortskaffa avfallet genom att överlämna det till ett uppsamlingsställe avsett för återvinning av avfall från elektriska och elektroniska produkter. Separat insamling och återvinning av avfallet hjälper till att spara på våra naturresurser och gör att avfallet återvinns på ett sätt som skyddar människors hälsa och miljön. Kontakta ditt lokala kommunkontor, din närmsta återvinningsstation för hushållsavfall eller affären där du köpte produkten för att få mer information om var du kan lämna ditt avfall för återvinning.

Glossary

ACP	Array control processor. On some XP models, such as the XP12000, the ACP handles the passing of data between the cache and the physical drives. On other XP models, such as the HP XP10000, this function is handled by the disk adapter on the MIX board.
AL	Arbitrated loop.
AL-PA	Arbitrated loop physical address.
allocation	The ratio of allocated storage capacity versus total capacity as a percentage. "Allocated storage" refers to those LDEVs that have paths assigned to them. The allocated storage capacity is the sum of the storage of these LDEVs. Total capacity refers to the sum of the capacity of all LDEVs on the disk array.
array group	A group of 4 or 8 physical hard disk drives (HDDs) installed in an XP disk array and assigned a common RAID level. RAID1 array groups consist of 4 (2D+2D) or 8 HDDs (4D+4D). RAID5 array groups include a parity disk but also consist of 4 (3D+1P) or 8 HDDs (7D+1P). All RAID6 array groups are made up of 8 HDDs (6D+2P).
BC	The HP StorageWorks Business Copy XP software program, which enables you to maintain up to nine internal copies of logical volumes on the disk array.
C-Track	The HP StorageWorks XP Continuous Track software program, which detects internal hardware component problems on a disk array and automatically reports them to the HP STC.
Continuous Access	The HP StorageWorks XP Continuous Access program, which enables you to replicate data stored on a local disk array to a remote disk array.
cache	Very high speed memory that is used to speed I/O transaction time. All reads and writes to the XP array family are sent to the cache. The data is buffered there until the transfer to/from physical disks (with slower data throughput) is complete. The benefit of cache memory is that it speeds I/O throughput to the application. The larger the cache size, the greater the amount of data buffering that can occur and the greater throughput to the applications. XP arrays support a range of cache memory. In the event of power loss, battery power holds up the contents of cache for up to 36 hours.
channel adapter (CHA)	The channel adapter (CHA) provides the interface between the disk array and the external host system. Occasionally this term is used synonymously with the term channel host interface processor (CHIP).
channel host interface processor (CHIP)	Synonymous with the term channel adapter (CHA).

channel processor (CHP) The processors located on the channel adapter (CHA). Synonymous with CHIP.

command device A volume on the disk array that accepts Continuous Access or Business Copy control operations which are then executed by the disk array.

control unit To organize the storage space attached to the DKC, you can group similarly configured logical devices (LDEVs) with unique control unit images (CUs). CUs are numbered sequentially. The disk array supports a certain number of CUs, depending on the disk array model. Each CU can manage multiple LDEVs. Therefore, to uniquely identify a particular LDEV requires both the CU number and the LDEV number.

CU Control unit.

CVS Custom volume size. CVS devices (OPEN-x CVS) are custom volumes configured using array management software to be smaller than normal fixed-size OPEN system volumes. Synonymous with volume size customization (VSC).

disk adapter (DKA) Synonymous with the term ACP.

disk controller (DKC) The array hardware that houses the channel adapters and service processor (SVP).

disk group The physical disk locations associated with a parity group.

disk recovery and restore unit (DRR) The unit responsible for data recovery and restoration in the event of a cache failure.

disk type The manufacturing label burned into the physical disk controller firmware. In most cases, the disk type is identical to the disk model number.

disk unit (DKU) The array hardware that houses the disk array physical disks.

emulation modes The logical devices (LDEVs) associated with each RAID group are assigned an emulation mode that makes them operate like OPEN system disk drives. The emulation mode determines the size of an LDEV.
OPEN-3: 2.46 GB OPEN-8: 7.38 GB OPEN-9: 7.42 GB OPEN-E: 13.56 GB OPEN-K: Not available on this array OPEN-L: 36 GB OPEN-M: Not available on this array OPEN-V: User-defined custom size

EPO Emergency power off.

ESCON Enterprise System Connection (the IBM trademark for optical channels).

expanded LUN A LUN is normally associated with only a single LDEV. The LUSE feature allows a LUN to be associated with 1 to 36 LDEVs. Essentially, LUSE makes it possible for applications to access a single large pool of storage. The LUSE feature is available when the HP StorageWorks LUN Configuration Manager product is installed.

ExSA Extended serial adapter.

failover Disconnecting a failed unit or path and replacing it with an alternative unit or path in order to continue functioning.

FC Fibre Channel.

FC-AL Fibre Channel arbitrated loop.

FCP Fibre Channel Protocol.

fence level A level for selecting rejection of a write I/O request from the host according to the condition of mirroring consistency.

FICON IBM mainframe Fiber Optic Connection.

GB Gigabytes.

GLM Gigabyte link module.

HA High availability.

HBA Host bus adapter. A built-in function or a card installed in a PC or other host computer to enable connection of the host to the SAN.

host mode Each port can be configured for a particular host type. These modes are represented as two-digit hexadecimal numbers. For example, host mode 08 represents an HP-UX host.

hot standby Using two or more servers as a standby in case of a primary server failure.

HP Hewlett-Packard Development Company.

I/O Input/output (applies to an operation or device).

LAN Local area network.

LD, LDEV Logical device. An LDEV is created when a RAID group is carved into pieces according to the selected host emulation mode (that is, OPEN-3, OPEN-8, OPEN-9). The number of resulting LDEVs depends on the selected emulation mode. The term LDEV is often used synonymously with the term volume.

LED Light emitting diode.

local disk A disk in the host.

LU Logical unit.

LUN Logical unit number. A LUN results from mapping a SCSI logical unit number, port ID, and LDEV ID to a RAID group. The size of the LUN is determined by the emulation mode of the LDEV, and the number of LDEVs associated with the LUN. For example, a LUN associated with two OPEN-3 LDEVs has a size of 4,693 MB.

LUSE Logical unit size expansion. See also *Expanded LUN*.

m Meters.

MB Megabytes.

MCU Main control unit.

MIX A circuit board in the disk control unit that includes disk adapters and channel adapters for interfacing disk drives and the host to cache memory.

mirroring consistency	The consistency (usability) of data in a volume (for example, S-VOL).
mm	Millimeters.
MR	Magnetoresistive.
ms, msec	Milliseconds.
mutual hot standby system	Two servers that are poised to cover for each other if necessary.
NAS	Network attached storage.
node	Logically speaking, an environment where instances can be executed. Physically, a processor, which is an element of a cluster system.
NVS	Nonvolatile storage.
OFC	Open Fibre Control.
OLM	Optical link module.
OS	Operating system.
PA	Physical address.
parity group	A parity group is a disk configuration in which multiple disks work together to provide redundancy. Synonymous with “array group.”
partition	Dividing a specific physical disk into two or more areas as if there are two or more physical disks.
path	Paths are created by associating a port, a target, and a LUN ID with one or more LDEVs.
PCI	Power control interface or peripheral component interconnect.
port	A physical connection that allows data to pass between a host and the disk array. The number of ports on an XP disk array depends on the number of supported I/O slots and the number of ports available per I/O adapter. The XP family of disk arrays supports Fibre Channel (FC) ports as well as other port types. Ports are named by port group and port letter, such as CL1-A. CL1 is the group, and A is the port letter.
P-P	Point-to-point.
primary rack	The HP XP10000 rack that contains the basic disk array components, including the controller and up to two disk chassis (up to 120 drives).
PS	Power supply.
RS	Russellstoll® , A brand of electrical plugs and receptacles manufactured by Thomas & Betts Corporation.
RAID	Redundant array of independent disks.

RAID group	See “array group.”
RAID level	A RAID Level is one of the ways that disk drives are grouped together to improve performance, data availability/reliability or both. RAID levels are defined from RAID0 to RAID6. HP StorageWorks Disk Arrays in the XP product family support RAID1, RAID5 and RAID6. Not all of these RAID levels are supported by all XP family members. Consult the owner's guide or your HP representative for the details of which RAID levels are supported by your specific XP disk array.
RAM	Random access memory.
RM	HP StorageWorks RAID Manager XP, a command line interface for managing XP arrays.
R-SIM	Remote service information message.
R/W, r/w	Read/write.
script file	A file containing a shell script.
SCSI	Small computer system interface.
second rack	The optional second HP XP10000 disk array rack that contains up to two additional optional disk chassis (up to 120 drives).
shell script	A command sequence executed by a UNIX shell.
sidefile	An area of cache used to store the data sequence number, record location, record length, and queued control information.
SIM	Service information message.
SMI-S	Storage Management Initiative Specification.
SMS	System managed storage.
SNMP	Simple Network Management Protocol.
SSID	Storage subsystem identification.
STC	HP Storage Technology Center.
SVP	Service processor, which is the PC built into the disk controller. The SVP provides a direct interface into the disk array. SVP use is reserved for HP support representatives only.
TB	Terabyte.
TCP/IP	Transmission control protocol/Internet protocol
TID	Target ID.
VSC	Volume size customization. Synonymous with CVS.
VOLID	Volume ID.
volume	Synonymous with LDEV.

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